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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/600,732	07/20/2000	GEORGES SMITS	TIENSE RAFF.	8993

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EXAMINER
CHUNDURU, SURYAPRABHA

ART UNIT	PAPER NUMBER
1637	16

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/600,732	SMITS ET AL.	
	Examiner	Art Unit	
	Suryaprabha Chunduru	1637	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *31 December 2002* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *65-97* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) *65-97* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 12/31/02 has been entered.

2. Amendment C (Paper NO. 14) and Supplemental Amendment (Paper NO. 15) filed on 12/31/02 have been entered.

3. Claims 29-64 are cancelled. New claims 65-97 are added.

Response to Arguments

4. With reference to the rejection maintained in the previous office action under 35 U.S.C. 103(a), applicants' arguments and amendment have been fully considered and the rejection is moot in view of the new grounds of rejection. Applicants' argument regarding the conventional growing conditions is fully considered but found not persuasive because the climatic conditions claimed in the instant invention overlaps the conditions cited in the prior art (Van Den Ende et al.). For instance the prior art teaches seeding of Cichorium intybus (chicory) on June 1 and the growing and processing periods ranges form 98 days (July 26th to November 3rd), 120- 145 days (June 1-October 4th, and June 1st to October 25th). Analysis of inulin degrading was carried out during September 13th to December 6th. These climatic periods in northern hemisphere (Belgium) fall partially out of conventional periods, which include low conditions. However, Processing includes storage of roots, which was carried out at +1^{0} C, suggesting no effect of low temperatures. Applicants' emphasis on breakdown of high PD inulin to lower fructans from 15

October onwards is fully considered, but is not found persuasive because the prior art indicates that a decrease in SST/FFT ratio probably enhances competitive inhibition by sucrose as an acceptor for FFT and suggests that FFT might then start to depolymerize larger fructans to smaller ones. The analysis of inulin in different growing and processing periods indicates the inulin synthesis and degradation, which include the periods (July 26th to August 20th) where the higher DP inulin was produced. Therefore the effect of low temperatures on inulin degradation is a limiting parameter which is obvious and known from the prior art cited. The rejection is moot in view of cancellation of claims 29-49.

New issues

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

A. Claims 65-97 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 65 is confusing for referring to the subject matter in the term "and/or". Thus it is unclear how the claims can simultaneously encompass all of these limitations (that is whether the limitation seeding, growing and processing are included or seeding or growing with processing are included). The claims should refer to the subject matter in the alternative only, the replacement of the term "and/or" with "or" or the addition of dependent claims are suggested.

B. Claims 65-97 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant

regards as the invention. The instant claim 65 recites "partially or wholly falls outside conventional ones" which is unclear and indefinite because it is unclear what the outside conventional period refers to (that is, are there any outside periods that are included other than the said periods recited in the instant claim 65). Further the term conventional period is a relative term and according to the specification on page 14, "conventional climatological temperature conditions for growing and processing is meant to a period of less than 220 consecutive days immediately preceding the end of the processing of the roots, low temperature conditions have occurred which trigger the FEH gene in chicory roots to a significant extent". It is not clear whether the conventional period is meant to clarify inclusion of low temperatures and inclusion of triggering FEH gene.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

A. Claim 65-78, and 89-97 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamazaki et al. (USPN. 4,613,377) in view of Van Den Ende et al. (Plant Physiol. Vol. 149: 43-50, 1996).

Yamazaki et al. teach a method for processing of chicory inulin from chicory roots through conventional manufacturing techniques, wherein Yamazaki et al. disclose that the source material for the process are tubers of Jerusalem artichoke (see column 11, lines 62-66); grown in appropriate regions under proper climatological temperature (grows well in colder conditions, even in waste lands) (see column 12, lines 3-9). Yamazaki et al. also discloses that the inulin could also be derived in similar fashion and could be efficiently produced and harvested in late October and ideally should be processed within a few months (see column 12, lines 21-27); obtaining partial or substantially complete hydrolysis product of inulin (see column 11, lines 62-66); the method of extracting inulin (40%-70% by weight) further comprises extraction with hot water and refining inulin by filtering and cation-exchange (see column 11, lines 1-49); production of fructoligosaccharides from inulin (see column 10, lines 36-56); fructooligosaccharides containing about 0-100% by weight of monosaccharides (see column 10, lines 51-56). However, Yamazaki did not teach the periods of seeding/growing/processing includes no triggering or production of fructan exohydrolase gene in chicory roots.

Van Den Ende et al. teach a process for synthesizing fructan (inulin) from chicory roots wherein Van Den Ende et al. disclose that (i) the source material for the process are roots of chicory grown in appropriate regions and processed under proper climatological temperature which has not triggered fructan exohydroxylase (FEH) in chicory roots (see page 44, column 1, paragraphs 1-4, page 47, column 1, paragraph 2); (ii) chicory roots were grown for a period of at

least 150 days- 180 days and the period selected from periods ranging from June 1, July 26th to November 3rd , October 4th to October 25th, September 13th to December 6th (see page 44, column 1, paragraph 4) ; (iii) chicory roots stored at $+1^0$ C and analyzed at regular intervals (at least once a week) (see page 44, column 1, paragraph 4) and (iii) inulin was obtained with a standard grade chicory insulin with degree of polymerization (DP) ranging from 6-13 (page 45, column 1, paragraphs 1-4).

Therefore, it would have been prima facie obvious to a person of ordinary skill in the art at the time the invention was made, to modify a process for processing chicory roots for manufacturing inulin as taught by Yamazaki et al. with the method of growing and harvesting chicory roots as taught by Van Den Ende et al. to achieve expected advantage of developing a process for manufacturing chicory inulin from chicory roots under proper climatological temperatures because Van Den Ende et al. states that "seasonal changes in the biochemistry of fructan storing organs has been largely focused on the examination of changes in the stored carbohydrates. The observed changes in carbohydrate concentrations five-fold increase in fructose concentration) very well correlate with a breakdown of high DP fructans. The shift from high DP fructans from low DP fructans could be due to the action of FFT using low molecular weight carbohydrates as acceptors (see page 47, column 2, paragraph 2, and page 48, column 2, paragraph 2). An ordinary practitioner would have been motivated to combine the method of Yamazaki et al. with the method of Van Den Ende et al. by incorporating the proper climatological conditions which partially or wholly falls outside conventional seeding and growing conditions in order to achieve the expected advantage of developing an improved process of preparing chicory inulin.

B. Claims 79-88 rejected under 35 U.S.C. 103(a) as being unpatentable over Yamazaki et al. (USPN. 4,613,377) in view of Van Den Ende et al. (Plant Physiol. Vol. 149: 43-50, 1996) as applied to claims 65-78, 89-97 above, and further in view of Van Loo (USPN. 5,660,872).

Van Loo et al. teach a method for producing inulin free with low molecular weight polysaccharides (sugars) wherein Van Loo et al. disclose that the method comprises isolation of inulin from chicory roots with hot water to obtain aqueous solution of inulin, purification of inulin followed by concentrating the inulin solution by partial removal of water (see column 11, lines 47-62); the method also comprises obtaining inulin free of mono-and disaccharides, drying inulin to a particulate form (see column 12, lines 1-67, column 13, lines 1-17). Van Loo et al. further discloses obtaining inulin free of low molecular weight polysaccharides with DP greater than 5 (column 5, lines 5-44).

Yamazaki et al. teach a method for processing of chicory inulin from chicory roots through conventional manufacturing techniques, wherein Yamazaki et al. disclose that the source material for the process are tubers of Jerusalem artichoke (see column 11, lines 62-66); grown in appropriate regions under proper climatological temperature (grows well in colder conditions, even in waste lands) (see column 12, lines 3-9). Yamazaki et al. also discloses that the inulin could also be derived in similar fashion and could be efficiently produced and harvested in late October and ideally should be processed within a few months (see column 12, lines 21-27); obtaining partial or substantially complete hydrolysis product of inulin (see column 11, lines 62-66); the method of extracting inulin (40%-70% by weight) further comprises extraction with hot water and refining inulin by filtering and cation-exchange (see column 11, lines 1-49); production of fructoligosaccharides from inulin (see column 10, lines 36-56);

fructooligosaccharides containing about 0-100% by weight of mono saccharides(see column 10, lines 51-56).

Van Den Ende et al. teach a process for synthesizing fructan (inulin) from chicory roots wherein Van Den Ende et al. disclsose that (i) the source material for the process are roots of chicory grown in appropriate regions and processed under proper climatological temperature which has not triggered fructan exohydroxylase (FEH) in chicory roots (see page 44, column 1, paragraphs 1-4, page 47, column 1, paragraph 2); (ii) chicory roots were grown for a period of at least 150 days- 180 days and the period selected from periods ranging from June 1, July 26th to November 3rd , October 4th to October 25th, September 13th to December 6th (see page 44, column 1, paragraph 4) ; (iii) chicory roots stored at +1^{0} C and analyzed at regular intervals (at least once a week) (see page 44, column 1, paragraph 4) and (iii) inulin was obtained with a standard grade chicory insulin with degree of polymerization (DP) ranging from 6-13 (page 45, column 1, paragraphs 1-4).

However, neither Yamazaki et al. nor Van Den Ende et al. teach the production of inulin free of monomeric saccharides, dimeric saccharides and oligofructose.

Van Loo et al. teach a method for producing inulin free with low molecular weight polysaccharides (sugars) wherein Van Loo et al. disclose that the method comprises isolation of inulin from chicory roots with hot water to obtain aqueous solution of inulin, purification of inulin followed by concentrating the inulin solution by partial removal of water (see column 11, lines 47-62); the method also comprises obtaining inulin free of mono-and disaccharides, drying inulin to a particulate form (see column 12, lines 1-67, column 13, lines 1-17). Van Loo et al.

further discloses obtaining inulin free of low molecular weight polysaccharides with DP greater than 5 (column 5, lines 5-44).

Therefore, it would have been prima facie obvious to a person of ordinary skill in the art at the time the invention was made, to modify a process for processing chicory roots for manufacturing inulin as taught by Yamazaki et al. with the method of growing and harvesting chicory roots as taught by Van Den Ende et al. and the method of producing polydispersed saccharides as taught by Van Loo et al. to achieve expected advantage of developing a process for manufacturing improved Grade chicory inulin from chicory roots under proper climatological temperatures and because Van Den Ende et al. states that "seasonal changes in the biochemistry of fructan storing organs has been largely focused on the examination of changes in the stored carbohydrates. The observed changes in carbohydrate concentrations five-fold increase in fructose concentration) very well correlate with a breakdown of high DP fructans. The shift from high DP fructans from low DP fructans could be due to the action of FFT using low molecular weight carbohydrates as acceptors (see page 47, column 2, paragraph 2, and page 48, column 2, paragraph 2). Further, Van Loo et al. states that "the degree of polymerization (DP) has direct effect on the solubility of inulin and varies according to the conditions of harvesting chicory roots and saccharides comprise a DP greater than 2 would result in coloration, difficulty in solubility and crystallize at temperatures below 65^0 C" (see column 1, lines 55-67, column 2, lines 1-22). An ordinary practitioner would have been motivated to combine the method of Yamazaki et al. with the method of Van Den Ende et al. by incorporating the proper climatological conditions and production of inulin free of polydispersed saccharides in order to achieve the expected advantage of developing a method for production of improved grade inulin.

Conclusion

No claims are allowable.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Suryaprabha Chunduru whose telephone number is 703-305-1004. The examiner can normally be reached on 8.30A.M. - 4.30P.M, Mon - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary Benzion can be reached on 703-305-1119. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-3014 for regular communications and - for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0196.

Suryaprabha Chunduru
January 10, 2003

JEFFREY FREDMAN
PRIMARY EXAMINER